CURRENT STATUS OF ALL CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (amended) A method for transducing a human neuron with a heterologous gene, wherein said human neuron has a synaptic portion and a cellular portion, comprising:

providing a viral vector comprising a heterologous gene to be transduced into a human neuron; and

contacting the synaptic portion of said human neuron with said viral vector under conditions whereby said contacting results in transduction of the viral vector into said synaptic portion, and retrograde movement of said viral vector from the synaptic portion to the cellular portion, wherein said heterologous gene is incorporated into the genome of the human neuron.

2. (amended) The method of Claim 1, wherein said viral vector exhibits tropism toward human neurons.

3. (original) The method of Claim 2, wherein said viral vector is an adeno-associated viral vector.

4. (original) The method of Claim 1, wherein said method is performed *in vivo*.

5. (original) The method of Claim 1, wherein at least 1.5×10^7 infectious particles of said viral vector are provided.

6. (original) The method of Claim 1, wherein at least 1.5×10^8 infectious particles of said viral vector are provided.

7. (original) The method of Claim 1, wherein at least 1.5×10^9 infectious particles of said viral vector are provided.

8. (amended) The method of Claim 1, wherein said gene is further expressed by said human neuron for at least two months.

9. (amended) The method of Claim 1, wherein said gene is further expressed by said human neuron for at least four months.

10. (amended) A method for ~~increasing the proliferation~~ enhancing the survival of a nerve cell, wherein said nerve cell has a synaptic portion and a cellular portion, comprising:

providing a viral vector comprising a growth factor gene to be transduced into said nerve cell;

contacting the synaptic end of said nerve cell with said viral vector under conditions whereby said contacting results in transduction of the viral vector into said synaptic end, and retrograde movement of said viral vector from the synaptic end to the cellular end of said nerve cell; and

incubating said nerve cell under conditions whereby said growth factor gene is expressed by said nerve cell.

11. (original) The method of Claim 10, wherein said viral vector is an adeno-associated viral vector.

12. (original) The method of Claim 10, wherein said method is performed *in vivo*.

13. (original) The method of Claim 10, wherein at least 1.5×10^7 infectious particles of said viral vector are provided.

14. (original) The method of Claim 10, wherein at least 1.5×10^8 infectious particles of said viral vector are provided.

15. (original) The method of Claim 10, wherein at least 1.5×10^9 infectious particles of said viral vector are provided.

16. (original) The method of Claim 10, wherein said gene is further expressed by said neurons for at least four weeks.

17. (original) The method of Claim 10, wherein said growth factor gene is a gene encoding a nerve growth factor.

18. (amended) The method of Claim ~~17~~10, wherein said ~~nerve~~ growth factor gene is a gene encoding insulin-like growth factor I.

19. (amended) A method for treating a neurodegenerative disease in a human, comprising:

identifying a human patient in need of treatment for said neurodegenerative disease;

providing a viral vector comprising a therapeutic gene to be transduced into a synaptic end of said target neurons of said patient; and

introducing said viral vector into a terminal field of said target neurons of said patient under conditions whereby said contacting results in transduction of the viral vector into the synaptic end of said target neurons, ~~and~~ wherein said viral vectors migrate from the synaptic end to the cellular end of said target neurons, and wherein said therapeutic gene is expressed.

20. (original) The method of Claim 19, wherein said viral vector exhibits tropism toward neurons.

21. (original) The method of Claim 19, wherein said viral vector is an adeno-associated viral vector.

22. (original) The method of Claim 19, wherein at least 1.5×10^7 infectious particles of said viral vector are provided.

23. (original) The method of Claim 19, wherein at least 1.5×10^8 infectious particles of said viral vector are provided.

24. (original) The method of Claim 19, wherein at least 1.5×10^9 infectious particles of said viral vector are provided.

25. (original) The method of Claim 19, wherein said therapeutic gene is an anti-apoptotic gene.

26. (original) The method of Claim 25, wherein said anti-apoptotic gene is a member of the Bcl-2 family.

27. (original) The method of Claim 26, wherein said member of the Bcl-2 family is Bcl-xL.